Protein required to maintain full potential of stem cells

Posted: July 8, 2009

Created: 08/07/2009 - 12:12

Researchers at the University of California, San Francisco have pinpointed a protein that is critical for maintaining a stem cell's full potential to self-renew and to differentiate. Stem cells lacking the protein were impaired in their ability to divide and make identical copies of themselves, called self-renewal. These cells also lost their capacity to differentiate into key cell types, such as cardiac muscle. The protein, Chd1, acts to keep chromosome strands loosely wound, which permits widespread gene activation in the cell's nucleus. Previous studies hypothesized that this open chromosome structure is necessary in stem cells to maintain their potential to specialize into any cell type. Additional results in this study demonstrate that Chd1 is required for efficient reprogramming of adult cells, such as skin cells, back into a pluripotent state. These new insights into Chd1 function may lead to safer, more efficient methods for growing up large numbers of embryonic stem cells and deriving specific cell types, both critical steps for successful stem cell therapeutic strategies.

Nature, July 8, 2009 (online publication)
CIRM funding: Rupa Sridharan (T1-00002), Kathrin Plath (RN1-00564-1), Miguel Ramalho-Santos (RS1-00434-1)

Related Information: press release, University of California, San Francisco

Tags: Plath, Training, Ramalho-Santos, Sridharan, SEED, Understanding Stem Cell Biology, New Faculty, University of California San Francisco